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2223-72

July 28, 1972


MEMORANDUM FOR DSB TASK FORCE ON TACTICAL WARNING/ATTACK ASSESSMENT

SUBJECT: EXPANDED OUTLINE OF REPORT

The attached expanded outline of the report of our DSB Task Force on TW/AA contains "thesis sentences" which I have devised as a first cut for discussion. My concept of the report is that each section will consist of one page of terse text plus an illustration for a total of approximately 30 pages (which might be read). Volume 2, Appendices, can be as voluminous as we wish or can provide.

The sections of the report as outlined closely parallel the individual work assignments so that you should have no problem deciding which section is your domain.

See you on 13 - 14 September.

  
Fred A. Payne  
Chairman

Enclosure: Doc. #72-79697

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EXPANDED OUTLINE OF REPORT  
OF DSB TASK FORCE ON  
TACTICAL WARNING/ATTACK ASSESSMENT (U)

PREPARED BY

FRED A. PAYNE  
CHAIRMAN

July 28, 1972

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EXPANDED OUTLINE OF REPORT OF DSB TASK FORCE ON TACTICAL WARNING/ATTACK ASSESSMENT

I. Introduction

II. Summary

The U. S. has a large number of sensor systems which, collectively, form our attack warning function. It is proposed that these sensors, with possible additions and deletions, be organized into a National Attack Warning and Assessment System (NAWAS) for use by the National Command Authority and Operating Commands.

The proposed NAWAS consists of (1)

(2) a set of secondary sensors and systems, (3) readout and processing centers, and (4) subscriber displays for appropriate users. The most important new element of the proposed system is the data processing which provides high confidence of attack characteristics through correlation of independent sensor information.

The information produced by the processing centers is transmitted to subscriber terminals and displayed on a "situation board," which is adaptable to modest facilities such as aircraft and temporary locations. A most difficult problem is to make the displayed information subjectively credible to one not necessarily familiar with system details. This is accomplished by real time exercise on peacetime events.

Existing and programmed sensors allow the proposed NAWAS to make high confidence predictions in the absence of nuclear events. Inadequate sensor coverage can permit some small or specialized attacks to occur undetected.

The proposed system performance will probably degrade rapidly after nuclear detonations due to a combination of destruction of system elements,

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## II. Summary (continued)

blackout of sensors and general disruption. It is likely that the last pre-nuclear prediction will be as good as any real time, post attack, assessment.

Certain scheduled sensor upgrades, new sensor options and technology programs promise improved performance. This report discusses these possibilities, but does not address them in any technical depth.

Data in the proposed NAWAS can be used to advantage by the Operational Commands by special readout of detail not essential for National Command Authority consideration.

The currently approved or planned program for systems now justified for Tactical Warning will result in a total expenditure of \$ \_\_\_\_ B for the FY 74-80 period. An estimate of the new program required to provide a NAWAS as described would require an additional \$ \_\_\_\_ B. A saving of \$ \_\_\_\_ B is possible by phase out of selected sensor systems. The system may be extended and refined by the addition of improved elements which would require \$ \_\_\_\_ B.

Figure 1. Proposed NAWA System

## III. Statement of the Problem

Figure 2. Operational Sensors

Over the years the U.S. has installed or converted many warning sensors which can be used for attack warning.

The collection has grown  mostly to solve some particular section of the overall problem.

Because of the nature of the evolution there exists great redundancy in some areas and deficiencies in others.

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### III. Statement of the Problem (continued)

There exists the option to form a higher level system which integrates the assembly of sensors into a National Attack Warning and Assessment System for NCA use.

The resulting system can be designed to also serve the needs of Operational Commands.

Some obsolete or redundant sensor systems can be phased out to offset the cost of implementing the NAWAS.

### IV. Proposed System

#### Figure 3. NAWAS Elements

##### 1. System Description

The minimum number of existing primary sensors has been selected to provide reliable double coverages for each threat.

Attractive replacement possibilities exist for one of the older systems.

A number of secondary sensors and systems could be used for backup or corroboration. These systems would be justified for other uses and used if available and convenient.

Three primary data processing centers are selected because of redundancy, capacity, and convenience for operating commands.

These centers will perform uniform comparisons, correlations and predictions to drive user displays where desired.

A compact display will be proliferated at convenient locations for NCA use.

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#### IV. Proposed System (continued)

##### Figure 4. Typical Mission Profile

##### 2. Data Processing

The correlation of the time and track of trajectories between independent sensors can provide very high confidence predictions.

This correlation is performed independently by three identical software packages in each of the processing centers.

The logic of the software is designed to make maximum utilization of all primary and secondary sensors/systems.

The typical mission profile shown illustrates how this process would work in a simple case.

More complex cases can be handled by the same logic.

The software package required is estimated to consist of approximately \_\_\_\_\_ Fortran instructions which compares with \_\_\_\_\_.

Figure 5.

##### 3. Subscriber Display

The basic display is shown. This can be packaged into a console of size \_\_\_\_\_.

The processing system is designed to present the level of aggregation which will fill the board.

Auxiliary displays such as maps, sensor data, etc., may be added as desired.

Figure 6.

##### 4. System Credibility

The people who must believe the data and predictions are a handful of decision-makers, not the myriad of technicians familiar with system details.

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IV. Proposed System (continued)

One believes speedometers, clocks, etc., because they are exercised continuously and credibility is thereby obtained.

The real time observation and prediction of worldwide peacetime events such as U.S. and USSR missile launches, aircraft flights, exercises, nuclear tests, etc., is the device by which similar credibility can be instilled in the NAWAS performance.

The illustration depicts a hypothetical SS-11 test firing. This display sequence may be compared with the Typical Mission Profile logic shown on page \_\_\_\_\_.

Figure 7. NAWA System Performance

5. System Performance - Pre-nuclear Events

Existing and programmed sensors allow the proposed NAWAS to make high confidence predictions in the absence of nuclear events. Inadequate sensor coverage may allow some small or specialized attacks to occur undetected.

6. System Performance - Post nuclear Events

The proposed NAWAS performance will probably degrade rapidly after nuclear detonations due to a combination of destruction of NAWAS elements, blackout of sensors and general disruption. It is likely that the last pre-nuclear prediction will be as good as any real time post attack assessment.

7. Future Improvement Possibilities

Certain scheduled sensor upgrades, new sensors and technology

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IV. Proposed System (continued)

programs promise improved performance. This report discusses these possibilities, but does not address them in any technical depth.

8. Operational Command Requirements

Data in the NAWA System can be used to advantage by the Operational Commands by special readout of detail not essential for NCA consideration.

V. Program Alternatives

Figure 8. Tactical Warning Program

1. Currently Approved/Planned Program

The currently approved or planned program for systems now justified for Tactical Warning is shown. Total expenditures is \$\_\_\_\_\_B for the 1974-80 period.

Figure 9. NAWAS Program

2. Proposed NAWAS Program

An estimate of the program required to furnish the NAWA System as described is shown, assuming a FY 74 go-ahead. Also shown is the saving possible by phase out of selected sensor systems.

Figure 10. NAWAS Program

3. Possible NAWAS Improvements

The NAWAS as proposed is based only on currently available or planned programs. The system may be extended and refined by the addition of the improved elements.

Vol. 2. Technical Appendices

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SKETCHES OF ART

INPUT DATA					
TIME	SENSOR	EVENT	THREAT	LAUNCH LOCATION	ASS. LEVEL
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

PREDICTION					
EVENT	TIME	TTG	IMPACT POINT		NAME
			LAT	LONG	
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

FORCE STATUS		
TIME	ELEMENT	STATUS
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]

Fig. 5.

SKETCHES OF ART

INPUT DATA					
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

PREDICTION					
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
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[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Fig. 6.

SKETCHES OF ART

NAWA System Performance

Event	No. OBSERVATIONS		Accuracy	
	Primary	Secondary	hazh Point — n.m	Impact — n.m
1	—	—	—	—
10	—	—	—	—
100	—	—	—	—
1000	—	—	—	—

SLB

1	—	—	—	—
10	—	—	—	—
100	—	—	—	—
1000	—	—	—	—

Aircraft

1.  
10  
100  
1000

Fig 7

SKETCHES OF ART

Tactical Warning Program

System	74	75	76	77	78	79	80	81	82
RT&E	x	x	x	x	x	x	x	x	x
System A									
B									
C									
D									
E									
F									
G									

Investment

A  
B  
C  
D  
E  
F  
G

Operations & Maintenance

A  
B  
C  
D  
E  
F  
G

Fig 8

Total x x x x x x x x x x

SKETCHES OF ART

NAWAS Program							
	FY						
	74	75	76	77	78	79	80
<del>Phase out</del>							
<del>Phase out</del>							
ROTFE	x	x	x	x	x		
Investment	x	x	x	x	x	x	
O&M		x	x	x	x	x	x
Sub Total	x	x	x	x	x	x	x
Approved Program	x	x	x	x	x	x	x
Sub Total	x	x	x	x	x	x	x
Phase out Savings							
400X			a	a	a	a	
900X			b	b	b	b	
u				c	c	c	
u					d	d	
Total	x	x	x	x	x	x	x

Fig 9

SKETCHES OF ART

NAWAS Program							
	FY						
	74	75	76	77	78	79	80
<del>Phase out</del>							
NAWAS Proposal	x	x	x	x	x	x	x
I	x	x	x				
II	x	x	x				
III	x	x	x				
IV	x	x	x				
Augmented Total	x	x	x	x	x	x	x

Fig 10